

## Trace gas analysis device in the Tera-Hertz (THz) range



### Keywords

- (Gas
- Analysis
- Terahertz
- Spectroscopy
- Traces (ppb-ppm)



### Intellectual Property

French patent filing, dated June 29, 2017



### Development Status

Development of a laboratory-scale prototype capable of operating in the THz domain (corrugated waveguide, measurement by absorption spectroscopy).



### Partnership

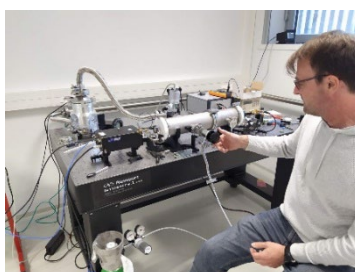
Co-investment 'SATT NORD - Industrial' (Licensing Agreements)

### Technology

#### innovation

- Detection of trace molecules (< ppb to a few ppm), for different applications, and in an increasingly restrictive environmental context
- Identification and quantification of trace gases alone or in a mixture, **in the THz range**

Development of an optical cavity improving the sensitivity of the THz spectro



MOLECULES	DETECTION LIMITS
HCN	3 ppb
H <sub>2</sub> S	100 ppb
CH <sub>3</sub> CN	50 ppb
SO <sub>2</sub>	200 ppb
H <sub>2</sub> O	500 ppb
HNC	2 ppb
HCl	20 ppb
HO <sub>2</sub>	300 ppb
NH <sub>3</sub>	60 ppb
SO	40 ppb
IO	200 ppb
OCS	400 ppb
H <sub>2</sub> CO	30 ppb

Calculated detection limit of gases accessible with the prototype

### Benefits

#### Alternative to existing methods

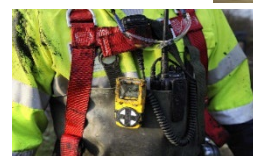
Excellent selectivity and high sensitivity

Trace gas analysis, alone or in a mixture

Identification of several molecules simultaneously

### Applications

- Gas sample taken directly
- Gas emitted by a liquid (Paint) or by a solid (Explosives)
- Analysis of smoke from industrial processes: identification and quantification of gases whose emission is regulated (TOX, SOX)
- Analysis of gas emitted by food



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